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Unconventional heavy-fermion superconductors probed by uniaxial stress

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In order to examine the nature of the superconducting order parameter in correlated electron systems, we reduce the lattice symmetry by applying uniaxial stress along one of the crystalline axes and investigate the superconducting transition by measuring the specific heat with an ac method. A compound of particular interest is UBe_{13}, in which superconductivity develops before a coherent Fermi liquid state. UBe_{13} belongs to a small class of heavy electron materials that are distinguished by an enormous electronic specific heat coefficient $\gamma \sim 1 J/molK^2$ and is one of the few compounds within this class that exhibits superconductivity. A splitting of the superconducting transition temperature T_c of the order of $\Delta T_c \sim 50 mK/kbar$ was predicted by theory in the case of some multicomponent order parameter scenarios. In order to probe this we study UBe_{13} single crystals of both "L" and "H" type, applying pressure along the (110) and (001) directions. An outlook on further candidate systems, such as Sr_2RuO_4, $CeCu_2Si_2$ and $CeCoIn_5$, is presented.